Shropshire Botanical Society

Newsletter

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Front Cover photos

Top left: *Myosotis ramosissima* Top right: *Myosotis discolor* Bottom: *Myosotis sylvatica* (all photos by Dan Wrench)

Our thanks to the Shropshire Wildlife Trust and the Field Studies Council for their generous support of our society. Both organisations support the work of the society in recognition of the importance of the contribution we make to understanding Shropshire botany.

Society News

The sun continues to shine as I write this introduction to the autumn newsletter in the 30th anniversary year of the society. This is a cause for celebration and thanks to all the dedicated botanists, recorders, authors and supporters over the years who have contributed so much to our knowledge and enjoyment of the botany of Shropshire, despite the busy-ness of modern life. Those of you who attended the Spring AGM meeting will be aware that Prof Ian Trueman stepped down as Chair and was unanimously elected as the first President of the society in thanks and recognition of his enormous contribution to the society. Sarah Whild was given Life Membership in honour of services to botany in the County. Special thanks are due to Sarah for stepping in as acting Chair whilst we sort something out.

Several different people have asked for an index for all the newsletters to make it easier to find articles, especially those on identification. If anyone would like to volunteer to help make an index, please contact Dan Wrench on shropbotsoc@gmail.com. This edition has some top tips for the identification of *Myosotis*. There are also details of an important study this year to find out more about the *Nuphar pumila* Least Water-Lily at the only England population in Cole Mere SSSI, Shropshire. There is news of the amazing £4.9 millon Marches Mosses BogLIFE fund award to extend the restoration work of the Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC.

You will notice that there is no longer a list of members with a reminder about when your subscription is due at the back of the newsletter. Members will receive an email reminder, or if we don't have an email address for you, a note posted with your newsletter. Please tell us your current email address by emailing: shropbotsoc@gmail.com. Sad news that two of our stalwart members, Pam Green and Shirley Burton, have passed away; we offer our sincere condolences to family and friends.

Winter meeting

Winter Meeting, 2-4 pm, Saturday December 10th 2016, at our usual venue Preston Montford Field Centre, Montford Bridge, Shrewsbury, SY4 1DX. Dr Tim Rich will be giving a talk entitled:

"Collecting Seeds the Difficult Way!"

Tim is an independent botanist and botanical author, and has specialist interests in the taxonomy and ecology of Brassicaceae, *Sorbus*, *Hieracium* and *Taraxacum*.

You can't have your cake……

Botanical Society members will be sad to hear that Ruth Dawes, after many years of stalwart effort, has retired from her responsibility to provide delicious cakes for the Christmas meeting. She is due an enormous vote of thanks from those of us who appreciated the cakes, and the gentle persuasion with which she approached potential bakers. Her organisation was amazing and both cakes and fiendish quiz have been an integral part of the annual Christmas meeting and we would like Ruth to know how grateful we are for all her hard work over the years.

The BotSoc committee would like to propose our own non-competitive botanical bake-off. We would like to invite offers of cakes from members and challenge you to bake your favourite recipe. Interesting plant based ingredients would be very welcome; Latin names for these are optional!

In order to replicate some semblance of Ruth's organisation, volunteers can e-mail or phone me with offers: Penny Wysome, 01952 242617, pennywysome@yahoo.com.

Other dates for your diary

The following indoor meetings will both take place at Preston Montford Field Studies Centre, Montford Bridge, Shrewsbury, SY4 1DX

Spring Meeting and AGM: Saturday April 8th 2017

Winter Meeting: Saturday December 9th 2017

Field Meetings dates and locations will be issued with the Spring 2017 newsletter.

Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SSSI and Special Area of Conservation (SAC)

Mags Cousins

The SAC is the third largest lowland peatbog in the UK (949.2 ha) and it straddles the border between Shropshire and Wrexham County Borough in Wales. Natural England manages the main body of the National Nature Reserve under a joint agreement with Natural Resources Wales (NRW), whilst Shropshire Wildlife Trust manages Wem Moss. The main body of the bog (which I will refer to henceforth as Fenn's - but not including Wem Moss!) was drained in the past to enable peat cutting, agricultural improvement and afforestation and was rescued from near-destruction in 1990 by the Nature Conservancy Council. Since then massive strides have been taken to repair the damage and bog plants and animals have started to return and peat forming *Sphagnum* mosses are growing again. Fortunately Wem Moss was not commercially cut for peat and has retained a more intact bog flora but has suffered dreadfully from drying out due to drainage of surrounding land.

The majority of the habitat of Fenn's is classified as either Degraded or Active Raised bog habitat - one of the few 'Priority EU habitats' for which the UK has 'special responsibility'. The habitat is characterised by a largely ombrotrophic (rain fed) raised bog complex on peaty substrates with an elevated surface (dome) which has its own water level well above the local groundwater level. Many of the areas classified as degraded bog on the site now relate to areas of pasture, woodland and conifer plantation which were previously part of the rand (sloping margin) and lagg (outer transition zone) of the peat bog. Lagg is an essential part of an active raised bog, a halo of fen and carr vegetation where acidic water draining off the bog domes meets mineral-rich water draining off adjacent mineral soils.

For the degraded and raised bog habitat the plant communities defined (but not exhaustively) by the National Vegetation Classification (NVC) found on

Aerial view of Fenn's

the SAC include:

M18 *Erica tetralix – Sphagnum papillosum* raised and blanket mire

M2 *Sphagnum cuspidatum/recurvum* (*fallax*) bog pool community

M3 *Eriophorum angustifolium* bog pool community

M15 *Scirpus cespitosus – Erica tetralix* wet heath

M20 *Eriophorum vaginatum* blanket and raised mire

M25 *Molinia caerulea – Potentilla erecta* mire

W6 *Alnus glutinosa – Urtica dioica* woodland

Much of the ombrotrophic dome has been lost due to peat extraction, and although generally the surface is above the surrounding land, collapse and compaction of the peat, and canalisation of the lagg stream to within the peat body, have resulted in enriched water affecting some of the peat. Until recent restoration works, the drainage water was taken through a ditch system right across the centre of the bog affecting the chemistry of the peat that the mineral rich water came into contact with. Disturbance of the lagg zone and conversion to agriculture and forestry has further exacerbated hydrological problems through interception, evapo-transpiration and shading.

For the most part, however, the peat body remains hydrologically intact, and the residual peat is on average 3metres deep, but in some areas exceeds 8m, which provides good potential for rewetting and restoration of active peat forming processes. Fenn's still supports a wide range of characteristic acid peat bog vegetation including twenty one species of Sphagnum moss, including *S. cuspidatum*, *S. subnitens*, *S. papillosum*, *S. magellanicum* and *S. capillifolium*, which represent successional stages in the development of a raised mire. Other characteristic species of acidic, low nutrient bogs include the two Cotton-grasses *Eriophorum vaginatum* and *E.angustifolium*, also *Drosera rotundifolia* Round-leaved Sundew, *Vaccinium oxycoccos* Cranberry, *Narthecium ossifragum* Bog Asphodel, *Rhynchospora alba* White Beak-sedge and *Andromeda polifolia* Bog-rosemary. This species is only found on raised bogs where there is a high water table with consistent water-logging. As a consequence it has declined nationally in response to disturbance and damage of lowland raised bogs but is quite widespread across Fenn's and has benefited from restoration works so far.

Utricularia minor Lesser Bladderwort, a carnivorous plant, used to be common in the 1930s on Fenn's Moss but declined due to peat cutting. It has increased more recently in areas which were flooded after damming, It is an aquatic plant of acidic nutrient poor bog pools, and traps water fleas in bladders made from modified leaves to supplement its diet.

In areas where past disturbance and drying has been greater, the vegetation is often dominated by *Molinia caerulea* Purple Moor-grass, often with birch and sometimes willow and pine scrub. Many of the expected habitats which would have occurred at the edge of the bog, (rand and lagg), namely marsh, fen, swamp and wet broadleaved woodland, are only present in small areas as a result of marginal drainage and agricultural improvement.

Andromeda polifolia Bog-rosemary

Needless to say Fenn's is also extremely important for a large range of specialist fauna, especially invertebrates, for example the attractive day flying Window-winged Caddis Fly *Hagenella clathrata*, an RDB1 species.

Marches Mosses BogLIFE project

The bog continues to face a range of issues that need significant investment, so a consortium of partners led by Natural England submitted a bid to the EU LIFE fund for a five year project entitled "Marches Mosses BogLIFE". The outcome of the bid was hanging in the balance post Brexit but eventually was awarded an amazing £4.9 million. Fortunately Treasury announced over summer that they will underwrite live LIFE projects if necessary once the UK has left the EU, which means that the financial future of this and other projects looks much more secure. Key partners in the bid were Shropshire Wildlife Trust (SWT) and NRW with sources of match funding from the Heritage Lottery Fund (HLF), Esmee Fairburn Trust and others.

Over the next five years the project will tackle:

- conifer, tree and scrub removal to reduce interception, evapo-transpiration and shading;
- raising water levels by bunding, adding and adjusting dams;
- improving water quality by diverting the poor quality water of Bronington Manor Drain to the edge of the bog;
- speeding up active bog processes and experimental remedial works including *Molinia* control trials and lagg restoration;
- monitor recovery and disseminate best practice guidance about the restoration techniques;
- removal of land contamination related to the purchase of Furber's scrapyard, adjacent to the NNR;
- trialling the development of a Site Nitrogen Action Plan to tackle aerial deposition of nitrogen;
- removal of moss gathering licenses;
- and community engagement work - Shropshire Wildlife Trust are leading the development of a Stage 2 Heritage Lottery Fund bid. This involves extensive consultations with the local community and other stakeholders.

Peat cuttings and cotton-grasses on Fenn's

The transformation of an abandoned area of peatland and Furber's former scrapyard to restore the habitats and create a brand new visitor facility is made possible by Shropshire Wildlife Trust embracing the challenge and purchasing the site. Unfortunately with the scrapyard comes contaminated land, 150,000 tyres, large areas of hard standing and even an empty coffin. For 25 years Natural England made every effort to work with the previous operator of the site without any progress, so SWT taking ownership is a massive step forward for the rehabilitation of the area. Any development will have to be careful to keep disturbance to a minimum to avoid releasing the contaminants.

Marches Mosses BogLIFE aims to involve 150 volunteers and 6 trainees in many different aspects of the project, so there will be ample opportunities for you to get involved, particularly with survey, monitoring and visitor engagement. If you are interested to know more contact:

Pete Bowyer, Reserve Manager, Fenn's, Whixall & Bettisfield Mosses NNR, Natural England, Manor House, Moss Lane, Whixall, Shropshire, SY13 2PD, Office Tel. 01948 880362, email: peter.bowyer@naturalengland.org.uk.

The vulnerability of peatbogs to climate change and air pollution

Simon Caporn, Richard Payne & Bjorn Robroek

Peatlands are the world's largest soil carbon pool, supporting a unique biological community and provide important ecological, economic and protective functions such as groundwater recharge and pollutant removal. Maintaining these critical functions depends upon protecting the integrity of the whole ecosystem. Peat cutting, drainage, and land conversion are all clear threats to peatlands. But, peatlands are also highly vulnerable to 'unseen' threats such as changes in precipitation, temperature, and nutrients.

In the spring of 2010, through the EU Biodiversa programme, we set up a research project called PEATBOG (Pollution, precipitation and temperature impacts on peatland biodiversity and biogeochemistry) to learn more about the diversity of peat bogs across Europe and to better understand the effects on bogs of past and current environmental factors like air pollution and to predict the potential impact of future changes in climate. The research was ambitious, calling on the expertise of researchers from across several European Universities and addressed questions at very different scales – such as: Why are bogs different across Europe? and: How are biological species and processes on individual bogs affected by experimental manipulations of temperature and water table?

In Britain, a local Shropshire site - the Cranberry beds, part of Fenn's, Whixall and Bettisfield Mosses NNR - came under research scrutiny, chosen for being representative of an intact ombrotrophic bog in an area of fairly high atmospheric nitrogen pollution enabling comparisons with bogs in cleaner parts of the UK further north and west. All the UK sites were also part of a larger survey of the flora across European bogs (with help from Italian Luca Bragazza) which involved travel to 56 bogs in the peat-forming regions of Europe and detailed quadrat surveys of the vascular plants, bryophytes and lichens. This unique snapshot of the condition of the flora of European bogs identified climate (rainfall and temperature) as the main driver of differences in species richness, with a trend towards fewer species in warmer regions. Air pollution - nitrogen and sulphur deposition - was also an important influence on the bog species composition. At the Cranberry beds, the plant community was found to be similar to bogs in warm regions receiving moderate to high nitrogen deposition (such as Netherlands, Belgium, northern Germany, Denmark) but contrasted with the communities of the other sampled UK bogs (in north Wales, Cumbria and Scotland) which had more in common with sites in cleaner, oceanic regions of mainland Europe (such as Norway, southern Sweden).

In order to examine more closely the influences of climate and pollution we built an experiment on the Cranberry Beds allowing us to manipulate two factors (Figure 1). Firstly, we used clear acrylic

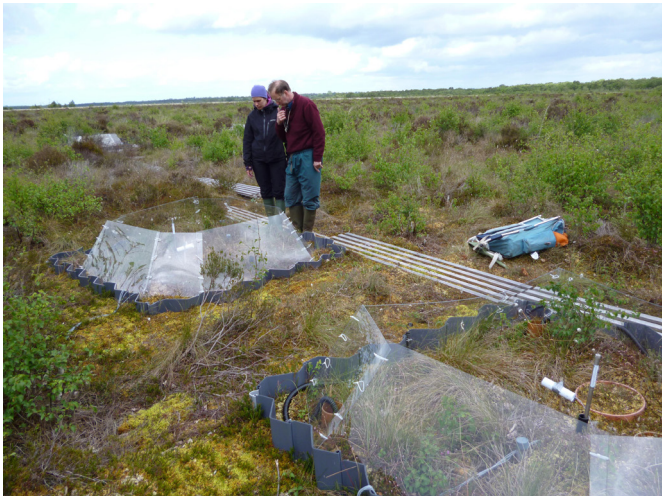


Figure 1: The PEATBOG climate change chambers on the edge of the Cranberry Beds (2010-2013), showing the plastic walls to elevate temperature and (in the foreground) the pumping pipes to lower water table.

shelters to warm small 2 x 2 m plots by 1-2° C (mean annual temperature). Secondly, the peat in the plots was hydrologically isolated from the surrounding bog using plastic piling so that we could pump out and lower the water table during a six week summer period. To investigate the interaction of climate effects with air pollution, the manipulation experiment at the Cranberry beds was replicated at the less polluted coastal

Figure 2: Typical flora in a control chamber, with a good coverage of bryophytes, mainly Sphagnum and Aulocomnium palustre. In the centre are air temperature and water table probes.

Figure 3: Typical flora in a warmed chamber, showing an increased dominance of vascular plants (especially Erica tetralix, Vaccinium oxycoccus and Eriophorum vaginatum) and a fall in the cover of bryophytes which has not recovered after removal of the warming covers.

site at Cors Fochno bog, a few miles north of Aberystwyth. Since 2010 we have monitored plant species composition of the experimental plots using fixed position quadrats and pin-touch plant cover measurements and discovered important changes in response to the warming and drying treatments.

At the Shropshire site after two years, there was a very clear decline in *Sphagnum* moss cover in the warmed plots, which was even worse in the combined warmed plus summer-drought treatment. At the same time, vascular plants increased, mainly due to increased growth of *Erica tetralix* Cross-leaved heath and *Vaccinium oxycoccus* Cranberry. Even though the warming and pumping treatments stopped after the 2013 season we have seen no following recovery and the vascular plants continue to dominate over the bryophytes (Figures 2 and 3). In contrast, at the similar experiment on Cors Fochno we saw no significant decline in *Sphagnum* due to warming and drought. It is possible that the history of nitrogen deposition in Shropshire has made the vegetation vulnerable to change in a warmer and drier environment. Continued monitoring of the dynamics of vegetation change will help us understand these changes. The combination of relatively short-term manipulation experiments to alter climate combined with large-scale regional comparisons across different climate and pollution zones provide two very complementary approaches to research the potential impacts of environmental change on peatlands. Results from the vegetation studies outlined here suggest that plant communities, particularly the *Sphagnum* flora of bogs are vulnerable to warming and periodic drought that are predicted to be more common in the future.

Simon Caporn (Manchester Metropolitan University),
Richard Payne (University of York),
Bjorn Robroek (University of Southampton)

Acknowledgements: Thanks to Dr James Rowson and project leader Professor Nancy Dise. Excellent support was provided by Dr Joan Daniels MBE and Peter Bowyer of Fenn's, Whixall and Bettisfield Mosses NNR.

Myosotis – how not to forget

Mags Cousins

Seven species of *Myosotis* have been recorded in Shropshire, three of which are axiophytes (Ax):

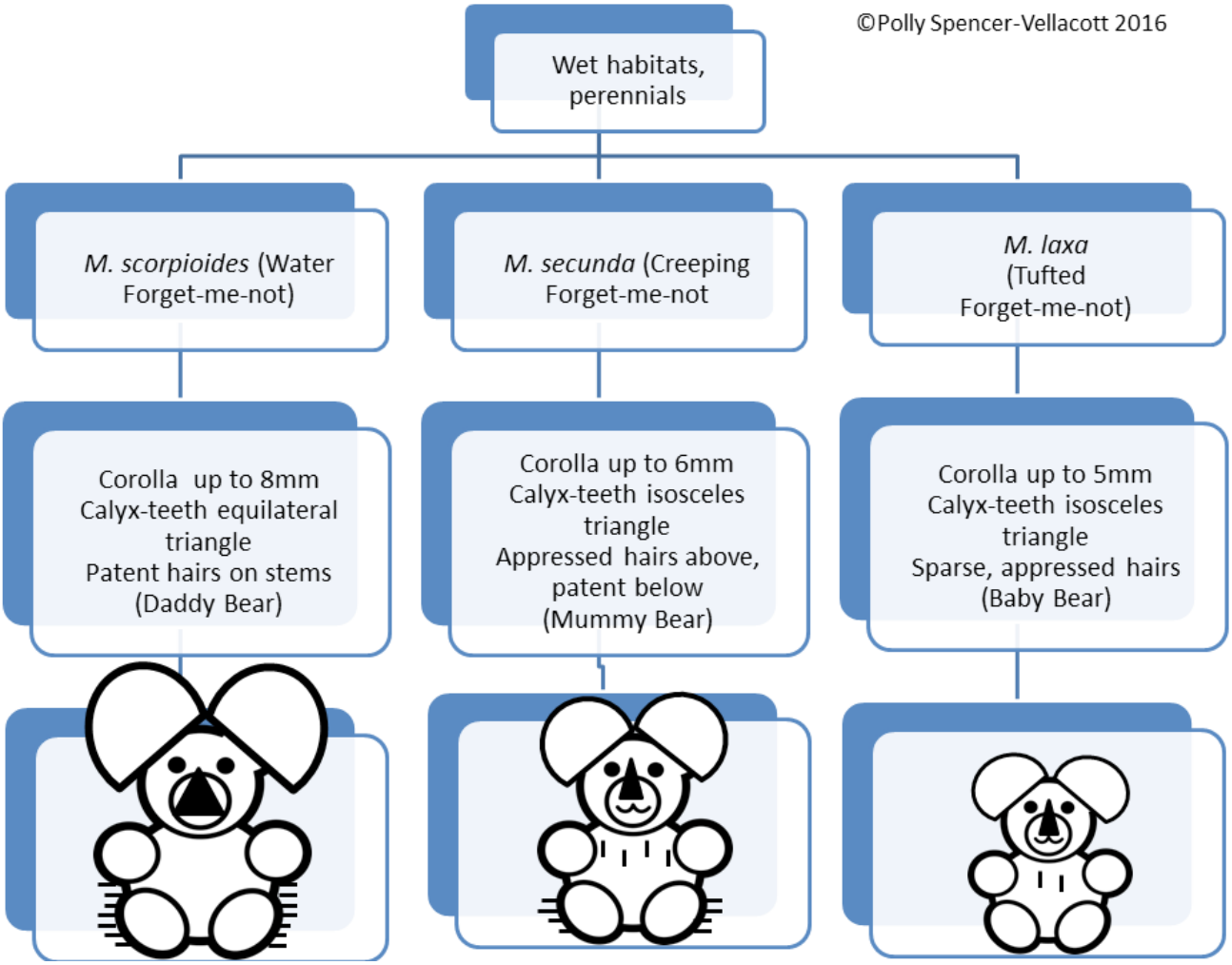
Myosotis in Shropshire		**Ax**
Myosotis arvensis	Field Forget-me-not	
Myosotis discolor	Changing Forget-me-not	Yes
Myosotis laxa	Tufted Forget-me-not	
Myosotis ramosissima	Early Forget-me-not	Yes
Myosotis scorpioides	Water Forget-me-not	
Myosotis secunda	Creeping Forget-me-not	Yes
Myosotis sylvatica	Wood Forget-me-not	

The species do have distinctive characteristics and there are not many of them, so you would think it would be easier to remember how to tell them apart. So if you don't wish to be taunted by their English name 'Forget-me-not' any longer here are some handy tips for identification, kindly provided by Polly Spencer-Vellacott, (Vice-county Recorder, Flintshire) who gave a workshop on this group at the BSBI Recorders Conference in September this year.

Tabular key using floral features based on descriptions in Stace, 2010, Rose, 2006 and Streeter, 2009

	M. arvensis	***M. sylvatica***	***M. ramosissima***	***M. discolor***	***M. scorpioides***	***M. secunda***	***M. laxa***
	Field F-m-n	***Wood F-m-n***	***Early F-m-n***	***Changing F-m-n***	***Water F-m-n***	***Creeping F-m-n***	***Tufted F-m-n***
Hairs on calyx	Hooked/ curled				Appressed		
Hairs on stem	Patent	Spreading	Patent-hairy		Appressed or patently hairy	Appressed above but patent below	Appressed
Length of pedicel at fruiting	Pedicel 1.2-2x as long as fruiting calyx	1.5-2x as long as fruiting calyx	Pedicel shorter than fruiting calyx		1-2 x as long as fruiting calyx	2.5-5 x as long as fruiting calyx	Less than 2 x as long as fruiting calyx
Corolla size	≤5mm	**≤8mm**	≤3mm	≤ 2mm	**≤8mm**	≤6 mm	≤5mm
Corolla colour	Blue		Blue from start	Cream to yellow at first	Blue		Sky-blue
Corolla-tube length	shorter than calyx (corolla cup-shaped)	longer than calyx (corolla flat)	shorter than calyx (corolla cup-shaped)	longer than calyx (corolla flat)			
Calyx teeth					Broad, forming equilateral triangle	Narrow, forming isosceles triangle	
Length of style at flowering				Longer than calyx-tube	Exceeding calyx-tube	Shorter than calyx-tube	
Habitat	Dry	Dry, woods, but also garden escape	Dry, sandstone or limestone	As Early but also damp places and dune slacks	Wet	Wet, acidic	Wet
Life form	Annual to perennial, tufted to 30cm	Annual/ biennial to perennial, tufted, to 45cm	Annual to 25cm		Perennial with rhizomes and/or stolons, to 60cm	Perennial with stolons, to 50cm	Perennial, to 45cm

For the three species of wet habitats *M.scorpioides*, *M.secunda*, *M.laxa*, the allusion to the nursery rhyme involving the three bears is based on original idea by another serious botanist, Kate Thorne. Just think; bear size= length of scientific name; ears=petals; nose=calyx teeth; fur=hairs on the stem.



Other delightful aids to identification are the video keys posted on http://bsbipublicity.blogspot.co.uk/ complete with soothing music.

For subspecies and hybrids you can always refer to the Plant Crib by A. J. Silverside (August 1997) available from the BSBI identification pages of the website; http://bsbi.org/identification. There have no confirmed hybrids recorded in Shropshire to date so it would be advisable to get any you suspect checked. In any case and as always, don't forget to submit your records to Sarah Whild (Vice-county Recorder for Shropshire) s.whild@mmu.ac.uk.

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Myosotis arvensis

Myosotis ramosissima

Myosotis sylvatica

Myosotis laxa

Myosotis scorpioides

Myosotis secunda

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Conserving England's only population of *Nuphar pumila*, Least Water-lily

Mags Cousins

Fig 1. *Nuphar pumila* with uprooted rhizomes, probably by swans (photo by Stephanie Miles, Kew)

Earlier this year Natural England developed a project with the Royal Botanic Gardens (RBG) Kew, Richard Lansdown (Chair IUCN SSC Freshwater Plant Specialist Group), and the Shropshire Botanical Society to review of the status and condition of the *Nuphar pumila* population at Cole Mere SSSI, with a view to improving the in-situ conservation management of the species and establishing further colonies either at its extant site or elsewhere.

The species is considered to be at risk of extinction in England by 2020 and is on the England Red List as Critically Endangered. Cole Mere is the only remaining site for it in England, the next nearest populations are in Scotland. In Great Britain as a whole it is considered 'Least Concern' as the Scottish populations appear pretty stable.

Records indicate that *N. pumila* has been present in Cole Mere since at least the mid-1800s, the first record for Shropshire being 'in a mere near Ellesmere' by T. Cox in 1854 (Lockton and Whild, 2015). Historically there were possibly four other sites in Shropshire but now it is only present in two shallow bays on the northern edge of Cole Mere and has been lost from the southern edge possibly due to over shading.

Cole Mere is a high alkalinity shallow lake with a mean depth of 4.6m. It is currently considered to be in unfavourable condition due to poor water quality, in particular high Phosphorus (annual mean TP 73ug/l 2013-15), which results in an abundance of algae, reduced water clarity and an associated negative impact on the aquatic macrophytes (Cousins, 2016).

In Scotland *Nuphar pumila* is found in oligotrophic, or, more frequently, mesotrophic sites, some of which receive base-rich drainage water. It is found over a range of substrates including mud, silt and peat. It is a rhizomatous perennial and there are signs at Cole Mere that waterfowl, probably in particular Mute Swans with their long reach, are feeding on the submerged lettuce-like leaves and uprooting large numbers of the rhizomes (see Fig. 1). Kew will be developing a rhizome propagation protocol as this may be the most effective means for the plant to multiply and disperse naturally or assisted (Padgett, 2007).

The flowers are not automatically self-pollinated but are visited by insects which may effect either self- or cross-pollination. The seeds lack morphological adaptations for animal dispersal, and are killed by desiccation and completely

Fig. 2 Seed showing live tissue stained red (photo by Jenny Peach, Kew)

digested when eaten by birds or fish. Seeds have been collected and tested in the laboratory by the RBG Kew's Millennium Seed Bank team. A tetrazolium chloride test, a viability test which stains living tissue red (see Fig. 2), has found that 92% of the collected seeds are viable. To stimulate germination, the seeds are first subjected to a cold period to mimic winter, then low oxygen conditions to mimic being at the bottom of the lake bed. Successfully germinated seeds will be grown in the nursery at Kew. These might ultimately be used for re-introduction but would also provide an insurance collection in case the population in the wild is lost.

Nuphar pumila can hybridise with *N. lutea* which is also present at Cole Mere. One of the features that distinguishes between the two species is the shape of the stigmatic disk, which in *N. pumila* is distinctly lobed at the margin (see Fig. 3), whereas in *N.lutea* it is circular or slightly crenate at the margin (Stace, 2010). Hybrids may be intermediate between these two forms (Arrigo, 2016). The degree to which hybridisation may have occurred is also subject of the study as this in itself could be a threat to the integrity of the population. Plant tissue from Cole Mere and Scottish populations will be subject to genetic analysis by Kew as well as more traditional means of comparing the morphology of different populations.

Anecdotal evidence indicates that the remaining patches of *N. pumila* may have increased at Cole Mere over the last 5 years in response to the removal of shading shoreline trees. The project will develop a more robust means of monitoring the abundance/cover of the plant by enlisting the help of local divers from Inner Space dive club

Fig. 3 *Nuphar pumila* showing the bottle shaped ovary and the stigmatic disk, distinctly lobed at the margin (photo by Dan Wrench)

who will trace petioles from leaves on the surface, to rhizomes on the lake bed. This will enable correlation to be made between surface leaf cover and rhizome extent.

The project is primarily supported by NE's Species Recovery Programme, the Innovation Fund and the Lakes Restoration programme and also the Community Grant of the Meres and Mosses project and Corporate Sponsors. I wish to thank all involved especially the site owners and managers, Shropshire Council. The project will be reported in full once completed.

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Watch out, Carnivores about!

A poem by Ruth Dawes

Lesser Bladderwort is my name; the acid ditch is my domain.
To supplement my meagre diet, snap, I suck flies in my open trap.
Pretty primrose yellow am I, floating rootless where the darters fly.

Round-leaved Sundew is my name; sparkling viscose dew is my game.
Hesitate in my ruby red charms and I will grab you with hairy arms.
My enzymes will insects dissolve, no matter how hard they resolve
to struggle free. I need them all for tea.

Round-leaved sundew
Drosera rotundifolia

Once my big brother, **Greater Sundew**, lived here too.
The trees grew high, mire dried out too much; he said farewell
and popped his clogs. Sister, ***Drosera intermedia***, extinct here as well.
One day, maybe the bog will be wet enough again for these two?

Pitcher Plant is my name; imitating marbled meat is my game.
From distant North America whence I came.
Mischievous man put me here, in Whixall bog that gave no cheer.
Rainwater my pitchers did entrap, insects they did overlap.
Now man has moved me again, cosy Chester Zoo is my domain.
So much more educational here, inside my pitchers, man can peer.

If the carnivores don't get you, that old **Breakbones** will, farmer said.
Ossifragum is my specific name, a pretty yellow carpet I do claim.
In sour, nutrient poor bogs I grow, where sheep bones lack calcium, I know.

Ruth Dawes

(This poem previously appeared in *Reflections*,
published by Shropshire Wildlife Trust in 2015)

Pitcher plant *Sarracenia purpurea*

Where have all the tresses gone?

Ruth Dawes

In August and September, I made visits to many of the old sites in the Oswestry uplands to search for *Spiranthes spiralis*, Autumn Lady's-tresses and confirmed what I already feared, that the upland meadows were no longer suitable.

This tiny, delicate, late flowering orchid is primarily a species of CG2 *Festuca ovina-Avenula pratensis* calcicolous grassland communities. Plants of these communities are often very small and form a rich mix of plants that require a short, tight,

Crickheath Hill	Meadow	Hard grazed by stock
Nantmawr	Quarry	Overgrown with bramble, nettle and thistle
Pant lawns x several	Short turf	Regularly cut by new owner Hen pens Canine droppings
Pant roadside verge	Limestone grassland	Vegetation too long, cutting regime timing wrong for tresses
Swan Hill	Meadow	Bracken mown and left lying
Trefonen	Meadows x 2	Overgrown with scrub x 2

Spiranthes spiralis in short turf, Llanymynech Rocks Welsh side, R Dawes Sep 2016

Spiranthes spiralis, Llanymynech. R Dawes 2014. (1)

closed sward of well-drained springy turf. They favour steeper, sunny slopes and abandoned quarries, lawns, old tennis courts and reservoir embankments. They like warm, dry, lowland, temperate sites and often occur with *Carlina vulgaris* Carline Thistle, *Scabiosa columbaria* Small Scabious, *Briza media* Quaking-grass, *Helianthemum nummularium* Common Rock-rose, *Gentianella amarella* Autumn Gentian, *Blackstonia perfoliata* Yellow-wort, *Erigeron acris* Blue Fleabane and *Euphrasia nemorosa* Eyebright. *Spiranthes spiralis* is primarily a southern species in the UK and can also occur in sand dunes and less acid heaths.

Grazing of the turf by sheep and rabbits, which provide only small droppings and limited enrichment, to keep it permanently short seems to be a primary management requirement. It is believed by orchid specialists that this genus has a very strong requirement for nutritional support from its fungal partner (more so than *Dactylorhiza* and *Orchis* genera) even in mature plants; this

Scrubbed over field at Trefonen, R Dawes Aug 2016

must restrict colonisation. I tried looking for new sites in suitable habitat, such as Dolgoch Quarry, without success. When you combine this with a species on the edge of its range in Britain and Ireland, which has retreated to its core habitats, things are not looking good.

Given that the average age of the UK farmer is retired and their families are not following on, it is not surprising that pastoral management has changed. Some of the meadows are now horse paddocks, quarries are utilised to store little used machinery where bramble, nettle and thistle discourage prowlers and thieves, lawns change owners and councils make cuts in mowing regimes. Tresses do not tolerate any "improvement" to their grassland.

Llanymynech Rocks, a few lawns at Pant and a locked water board site remain our stronghold for this species, but most of the records are in Wales, not Shropshire. Long term warden, Celia Todd, comments that "they grow in the niche in between bare ground and longer vegetation", but *Clematis vitalba* Wild Clematis, happily invades these places very quickly. If a natural disaster, such as fungal disease sweeps through our Llanymynech population, (which happened to the *Ophioglossum* at Llynclys Common), then our tresses are stuffed.

I would be delighted to be proved wrong in my survey and hear you shout "Behind you" or "Oh yes there are."

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Footnote: Since my monitoring reports have reached Shropshire Wildlife Trust, they have kindly included a particular area in their winter work parties at Llanymynech and have liaised with Shropshire Council contractors for changes in the Pant roadside reserve management so that low growing plants can benefit. Thank you SWT for taking this on board.

Women botanists of the past in Shropshire

Alex Lockton

If you glance at the botanical literature you will find scant mention of women botanists in Shropshire, even though this county has no history of overt discrimination. From the earliest days, Leighton accepted records from women when available, and women were always welcomed in the Caradoc & Severn Valley Field Club and other fields clubs operating in the county. It seems that women have always been active in botany, and their contributions are, though not noticeably acknowledged, there to see if you take the time to look. In the Botanical Society we like to give credit where it is due, and to this end we always attribute the person or people who made a record, whether as collector, recorder or determiner. Surprisingly, perhaps, this is not standard practice – in many places records are attributed to organisations or the recorders names are suppressed altogether, citing the data protection act as justification (although I once phoned up the registrar to check, and he assured me that such was not the intention of the Act). So having found myself so often typing in the names of female botanists and wondering who they were, I have compiled, with a lot of help from my most excellent friend Chris Liffen and his wife Kate, some information to redress the balance. Here is a brief account, therefore, of some notable female contributors to botanical recording in the county.

Possibly the first record by a woman is an undated specimen at Cambridge of *Mentha arvensis* collected by a Miss Bell and Edward Williams in about 1800 at an unspecified location. Not an altogether auspicious start, but a first county record at that, and perhaps we will find out about Bell when more of her work comes to light.

Also collecting at about the same time was Mary McGhie (c. 1770-1844), the mixed-race daughter of a plantation owner from Jamaica who contributed 163 records to Leighton's Flora of 1841, but who would probably have collected her specimens many years before. Some of McGhie's records are very good ones, most spectacularly her find of *Erodium maritimum* on the Long Mynd, where it was only rediscovered by John Clayfield in 2007. But her *Pimpinella major* at Ludlow Castle may have been *Smyrnium olusatrum* and her *Cynoglossum germanicum* was undoubtedly *officinale*, and a short list of other likely errors casts a shadow over her work. We know she had a herbarium because Leighton saw some of her plants, and if it survives we could quickly clear up such questions and restore her reputation. It is also a shame that there are no dates on any of her records, as she would quite likely have made a number of firsts for the county. Taking 1841 as the date for all her records, *Buxus sempervirens*, *Sedum album, Lathyrus latifolius, Daphne mezereum*, *Datura stramonium, Stratiotes aloides, Tulipa sylvestris* and *Iris foetidissima* are among her first county records.

Mary Darby (1808-1873) was a member of the wealthy Darby family of Coalbrookdale and lived at Dale House until she married and moved to Baschurch in 1853. Her collection of plants was made in the 1830s, so I have left her name as Miss Darby on the database rather than Mrs Jones. It was transcribed by W.H. Painter in 1901 for inclusion in Hamilton & Benson's planned county Flora that was never published. There are 45 records listed, mostly from the Ironbridge area, although some from as far afield as Ludlow Castle and Bomere Pool. It is a good set of records, mostly axiophytes, and it includes many interesting things, such as the first notice of *Paris quadrifolia* at Benthall Edge. Her only first county record is *Malva neglecta* at Buildwas Abbey in 1833.

Harriet Moseley (1810-1870), of Buildwas and Malvern, collected plants in Shropshire in about 1837 and her collection is apparently at the Natural History Museum, although we currently know more about her from the list of 30 species at Broseley given in Leighton's Flora. Her most significant record is of *Bromopsis benekenii* at Astley – possibly from a specimen at the Natural History Museum, and dated 1886 on the Biological Records Centre database – although that might be a transcription error for 1836. If it was collected by Moseley, it must be the first county record, trumping the one by Augustin Ley given in our recent Flora by at least eight years. Otherwise her only first county record is *Pulmonaria officinalis* at Broseley in about 1837.

The only other woman mentioned by Leighton was a Miss Bage of Bangor, who collected *Pedicularis sylvatica* at Hanwood and who had plants in the collection of the Shropshire & North Wales Natural History and Antiquarian Society. We do not know where that has ended up.

Moving on past Leighton's time the first name of any significance to crop up is Mrs Lucy Trow (née Jones) (1828-1904) of Broseley. Her herbarium was catalogued by W.P. Hamilton in 1904 and contained 29 specimens of interesting plants, mostly from Benthall and Pitchford and dated 1856-1860. It includes plants gems such as *Utricularia vulgaris* at Pitchford and *Eranthis hyemalis* established at Benthall Church (a first county record). I imagine that all these lists to date were made for the purpose of self-education more than anything else, and they demonstrate considerable botanical knowledge but they would not go far towards producing a full county Flora.

If so, the same cannot be said about Charlotte Elizabeth Lloyd (1838-1913) of Shrawardine, who amassed a collection of 238 species in the vicinity of Ensdon, Montford and Shrawardine in the 1860s. This was catalogued by Hamilton in 1900 and includes a full range of the flora from horsetails to grasses (no ferns though, unfortunately). Lloyd exchanged specimens and localities with Elizabeth Foulkes Jones (1832-1922), who explored the limestone of the Oswestry district. Lloyd was the daughter of the vicar of Selattyn and Jones of the vicar of Llansilin, so they must have known each other well. Jones's herbarium contained specimens of 86 species and provides important early lists for places like Craig Sychtyn and Llynclys Pool.

One of the most notable discoveries by female botanists was *Epipogium aphyllum*, Ghost Orchid, which was found in 1876 by two schoolgirls, the Misses Lloyd of Broad Gate, Ludlow. The plant was then identified by Miss Lewis of Broad Street and subsequently refound in 1878 by Miss Peele – no men involved until Charles Babington and George Druce came along to see it and write it up a few years later.

Miss Brown, of Bridgnorth, contributed a list to William Phillips's 1877 publication on the ferns of Shropshire, which was designed to complete this missing part of Leighton's 1841 Flora. It is an important contribution, especially for the under-recorded SE part of the county. It is a shame that we know nothing else about Miss Brown, because she must surely have had a great deal of botanical knowledge to have come with 90 good records of pteridophytes. We don't know whether her records should be dated 1877 or 1841, but probably the latter, if I had to guess, as Phillips mostly used lists collected by Leighton.

Ann Kilvert (1828-1903) lived at Shawbury and later Grinshill, and contributed 68 localities to William Beckwith's unpublished list of plants from the late 1880s and early 1890s. They are all interesting plants – mainly axiophytes – and were probably from her herbarium. Again, she must have been a competent botanist and had a lot more knowledge than we will ever know about.

Eleanora Armitage (1865-1961) was strictly speaking a Herefordshire botanist, where she was infamously refused membership of the Woolhope Club despite being the best botanist in the county. She made occasional forays into this county, mainly to collect mosses, but she did record *Pyrola minor* at Stanton Lacy, and a few other things.

Elizabeth Mary Benson (d. 1904) was the wife of the enthusiastic collector Richard Benson, and occasionally accompanied him or made records in her own right.

Henrietta Mary Auden (1862-1954) lived in Church Stretton and sent in some 225 records to the Record of Bare Facts between 1892 and 1911. Again, a good list of less common plants, demonstrating a decent knowledge of botany. She was the first to record *Pinus nigra*, *Persicaria minor*, *Chenopodium rubrum*, *Plantago arenaria*, *Lamium maculatum* and *Carduus pycnocephalus*.

Muriel Onslow (née Wheldale) (1880-1932) was a biochemist at Cambridge University. Her herbarium at the University of Birmingham includes some specimens from Shropshire, such as *Viola lutea* at Stitt, collected in 1911.

Charlotte Eden Palmer (1830-1913) was plant collector whose large herbarium is now at the Natural History Museum. We have records of aquatics from The Mere, Ellesmere dated 1867 and we know she also collected at Caughley Wood some time before 1911. Hopefully many more records will emerge from this source eventually.

Frances Pitt (1892-1964) was a writer, traveller and wildlife film maker who lived at The Albynes, near Bridgnorth. She sent records in to the Record of

Bare Facts occasionally between 1910 and 1959. Her best discovery was of *Gagea lutea*, Yellow Star-of-Bethlehem, which was considered a first county record when she found it 'near Bridgnorth' in 1910 (when she was just 18 years old), but we now know of a specimen at SHY dated 1883 from Lyebatch near Alveley (C.W. Mackay), and Miss Pitt never revealed where she found hers (possibly the same place). Her other records (34 in total) include interesting plants such as two species of broomrape, ferns and arable weeds.

Eleanor Vachell (1879-1948) was a prominent botanist of her day, collecting plants from all around the country. Like most plant hunters, she only came to Shropshire to get rarities such as *Astrantia major* from Stoke Wood in 1922, but she also collected difficult plants such as pondweeds in the canals in the 1930s.

Kathleen Lilian White (later Mrs Wase) (b. 1910) was the daughter of Arthur White of Belle Vue, Shrewsbury. She collected plants with her father in the 1920s and contributed 19 records to the Record of Bare Facts, including some good finds at Viroconium, which was being excavated at the time.

Lily F. Chitty was an archaeologist and naturalist who contributed a small number of botanical records (mostly orchids) in the 1920s and 1953 but is better known for having donated, with her husband, Earl's Hill to the Wildlife Trust as its first nature reserve.

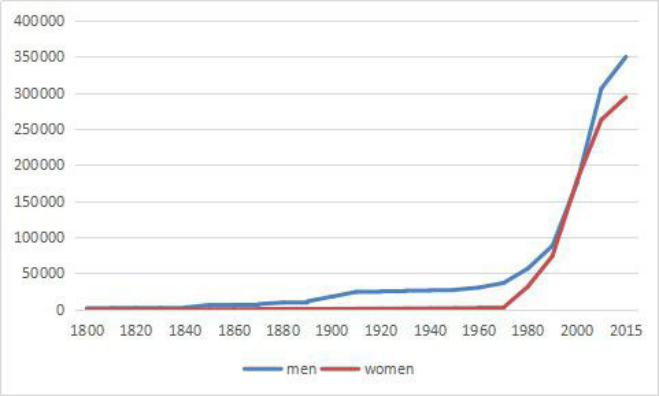
Ellen R. Lloyd was the first woman to be county recorder for Shropshire. She lived in Gobowen and contributed some 219 records between 1922 and 1953. Her first records include *Saxifraga* ˣ*urbium*, *Cotoneaster integrifolius*, *Lepidium virginicum*, *Sisymbrium irio*, *Symphytum orientale* and *Mimulus guttatus*. Although she was not the most dynamic county recorder, her work is solid and reliable and filled a gap when botany was at a low ebb.

From this time on, female botanists become much more common in the database. Notable people include Miss E.M. (Mary) Hignett (1912-2004) of Oswestry (448 records); Madeline Joyce Lee (1911-1991), a schoolteacher in Shrewsbury who made 486 records between 1937 and 1982; Honor F. Pendlebury (née Leeke) (1894-1970), wife of the master of Shrewsbury School, who made 145 records between 1939 and 1956 and published an account of Earl's Hill; and Norah Milburgha Mackenzie (1894-1980) of Meole Brace, who made 223 records between 1940 and 1972 and who seems to have served as a reluctant county recorder for some of that time.

There were some interesting visitors to the county as well. Christina Mayne Dony (née Goodman) was a plant collector who came to Shropshire and made 71 specimens between 1947 and 1985, the later ones with her husband John. Dorothy Adlington Cadbury (1892-1987) was a well-known pondweed collector and author of the world's first computerised Flora, and she collected some plants (all pondweeds) in the county between 1949 and 1966. Edna M. Lind was an expert on freshwater ecology from Westmorland who did some contract work on Bomere, Shomere and Clarepool Moss in 1950, and unfortunately made rather a hash of it. Vera Gordon used to come down from Liverpool and look for difficult plants such as pondweeds and brambles, between 1954 and 1975.

Miss M.H. (Hildred) Bigwood was a technician at Aberystwyth who made 121 interesting records around Shropshire between 1948 and 1984, including the first of *Allium paradoxum*. Lilian H. Hayward was the folklore recorder for the Caradoc Club, and she recorded some plants in South Shropshire between 1942 and 1953.

After this we come to the time of the Shropshire Flora Group and Sinker's Flora project, which was particularly notable for engaging a large number of women to do most of the fieldwork and all the data processing. We acknowledged some of these in the recent Flora, and perhaps a fuller account of their contribution can be made another day. I collect quite a lot of information about people on the database, so if anyone has any knowledge to contribute about any of our recorders, do please get in touch.



Cumulative number of records made by men and women since 1800.

Obituaries

Pamela Green - 16th August 2016

Pam Green was an amazing person to know - a poet, writer, broadcaster, and one-time owner of Shropshire Magazine, and she was also an accomplished botanist.

She contributed 1,532 records to the Shropshire Flora, and also recorded for the Shrewsbury Flora, Haughmond Hill Flora, and Attingham Park Flora. Together with Marjorie Leonard she recorded a Flora of Walcott Park.

Arguably Pam's most notable botanical achievement was finding *Cardamine impatiens* (Narrow leaved Bittercress) growing wild in the remarkable wild garden margins in Ratlinghope - this was a new site for this Nationally Scarce species, and I can remember Pam's joy at being right with her identification when she brought a specimen to show me.

Pam was 82 when she died in August 2016 but until her final few months she was a hugely energetic and engaging person who seemed to have an endless supply of enthusiasm for life. She leaves Roger (also a splendid botanist and bryologist and founder of SBS) and her four children, Ruth, Matthew, Nathaniel and Tim.

Sarah Whild

Shirley Burton - 29th April 1935 to 29th February 2016

Shirley Burton lived at Aston, near Nantwich and was a very popular botany tutor with Keele University. She taught adults in classes in Cheshire and Staffordshire and north Shropshire, including venues at Whitchurch and Wem. Shirley was also a dedicated plant recorder.

I first met Shirley in the early 1990s when she took over the Whitchurch class from Dr Peter Thomas. He warned us that she was a very different tutor from him and was a stickler for using correct scientific and common names of plants. I had persuaded my reluctant line manager to allow me to change my working hours so that I could attend the Whitchurch class once a week and managed to hang on to this privilege through a succession of managers. Tuesdays became my favourite day of the week from September to Easter, travelling with Marjorie Wainwright and the late Elizabeth Roberts.

Shirley taught us not only plant identification, morphology, ecology, biology, nomenclature and classification, but also how to use the new 'Stace'. She was an old school tutor, a good fair disciplinarian, with a quick put down for anyone who got out of hand. Only to be expected from someone who had spent a lifetime teaching teenagers and adults. She also had a quick sense of humour, patience with those who struggled and those who challenged. She once commented "I shall have to crack my whip here". I was mortified to hear a male student say *sotto voce,* "Yes, please Miss," but she took it in her stride. We were not allowed to be wimps. There were winter field trips, kitted out in coat, hat, scarf and fingerless gloves to write notes. I remember wind whistling through the *Molinia* at Whixall Moss, identifying winter twigs in parkland and gaining a thorough knowledge of basal rosettes on Nesscliffe Hill. Wenlock Edge on a particular big O birthday for Shirley was memorable. The late Jack Sankey, county bird recorder and keen botanist from Much Wenlock, came to join us. Many students encountered the lovely limestone flora of this site for the first time. One student with a camper van feigned illness and went back and then when we got back we surprised Shirley with a buffet, cake and err juice.

Statuesque Shirley was always smartly dressed in class, despite the use of messy chalk and a mini blackboard in a room with few modern facilities. Jackie Pedlow, long term warden at Llynclys Common, commented that "Shirley was the only person she had ever seen who could look smart in Rohan trousers." She was always early, well prepared and organised and it was straight in, heads down, working hard for at least the two hour session. She was a doting mum and gran and shared a love of music with her husband, John, a cousin. Shirley sang in three choirs for relaxation and one memorable New Year's Eve, I was one of the lucky ones to be at her house, cat on my lap, when John played his wind instruments.

We were all sad and shocked when we heard that energetic Shirley was very ill. Shafts of sunlight shone on a full house at Crewe Crematorium in March 2016. Everyone was there from Shirley's many interest groups to show their last respects.

RIP.

Ruth Dawes.